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# HOLMESINA SEPTENTRIONALIS, EXTINCT GIANT ARMADILLO OF FLORIDA

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In 1888 Joseph Willcox collected certain scutes of a fossil edentate on Peace Creek in Florida and forwarded them to Joseph Leidy who described them (1889A) as *Glyptodon septentrionalis*. Later Leidy (1889B) recognized that they did not belong to a glyptodont but to a gigantic armadillo and referred them to *Chlamytherium humboldtii* Lund, a species described from cave deposits in Brazil. This remained the status of this remarkable discovery until 1915, when Sellards (1915) described part of a lower jaw and some scutes from Vero, Florida, and mentioned material from other parts of the state. He showed that the species was not synonymous with that from Brazil, and revived Leidy's first name in the form *Chlamytherium septentrionale*. In 1922 Cahn described a good lower jaw supposedly of this species in Texas, and in 1926 Hay reported a second Texas occurrence, including a partial lower jaw with four teeth. The present writer has mentioned or figured various remains from Florida (Simpson, 1928, 1929A) and has listed twelve occurrences of the species in that state (1929B).

The work of Mr. Walter W. Holmes in Florida has resulted in finding large numbers of scutes and some other remains of this great armadillo. Some of these have already been mentioned in print, as cited in the preceding paragraph, and the scutes will be described in more detail in a forthcoming joint paper (Holmes and Simpson). In the present paper will be described a lower jaw, maxilla, and premaxilla recently found in Florida by J. E. Moore and added to the Holmes Collection of the American Museum. This specimen is the most complete yet found in North America and serves not only to define the species with greater precision but to indicate its true place among the chlamytheres as lately revised by Castellanos (1927). It proves not only to be totally distinct from *Chlamytherium humboldtii*, but to represent a new genus under the system established by Castellanos.

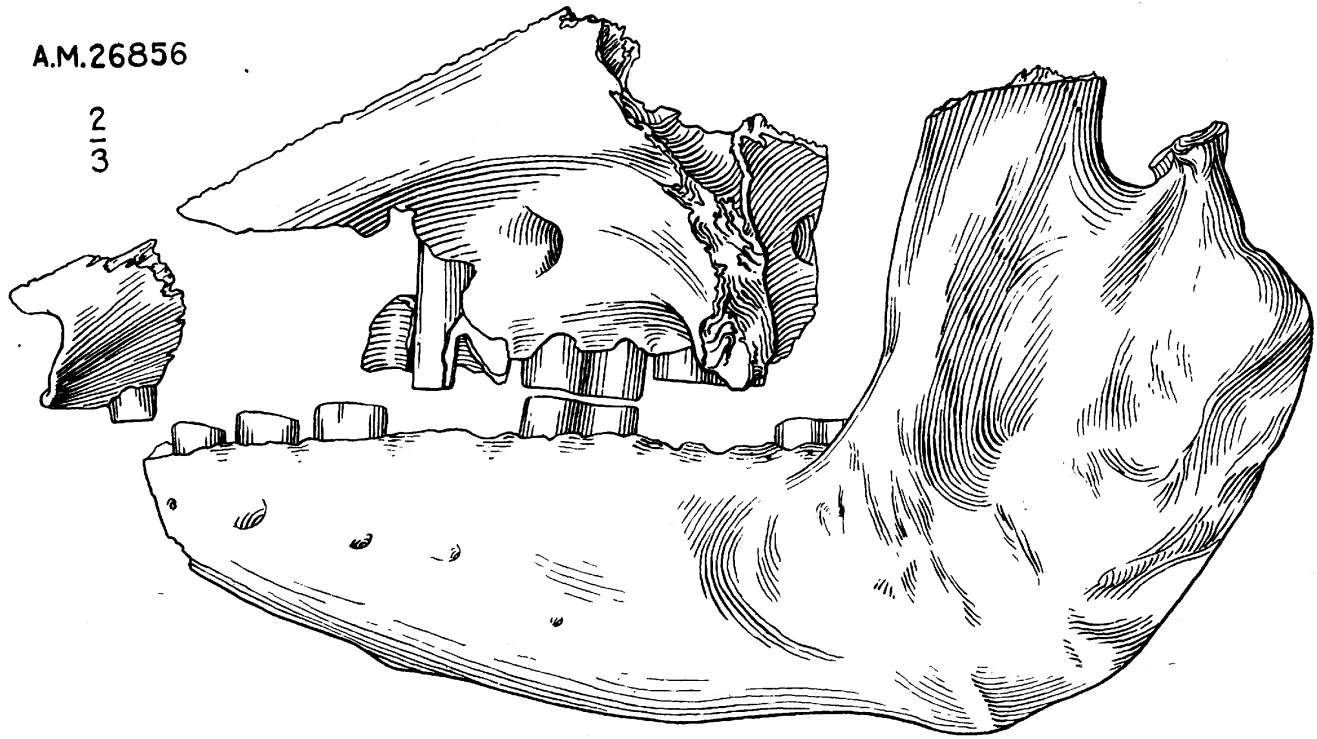


Fig. 1. *Holmesina septentrionalis* (Leidy). Premaxilla, maxilla, and mandible of neotype, Amer. Mus. No. 26856. Left lateral view. The premaxilla is reversed from the right side. Two-thirds natural size.

**HOLMESINA,**[1] new genus

TYPE.—*H. septentrionalis* (Leidy).

DIAGNOSIS.—A chlamytheriine armadillo most nearly related to *Kraglievichia* and *Chlamytherium*. One tooth in premaxilla. Fifth, sixth, and seventh upper teeth subequal, with vertical external and internal grooves, the internal well-defined, narrower and more anterior than the external. Second lower tooth subovate, with faint internal groove. Third and fourth with distinct internal grooves, obliquely truncated posterior sides, no external grooves. Fourth larger than third, much smaller than fifth. Ninth lower tooth small (about equal to fourth) pyriform, with posterior lobe smaller than anterior. Maxillo-premaxillary suture as in *Kraglievichia*, unlike *Chlamytherium*. Symphysis relatively shorter than in *Chlamytherium*, lower dental series convex upward. Scutes strongly pitted, with distinct but usually rounded keels.


Fig. 2

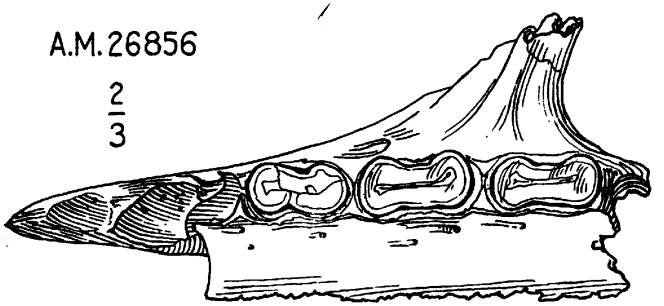


Fig. 3

Fig. 2. *Holmesina septentrionalis* (Leidy). Right premaxilla of neotype. Amer. Mus. No. 26856. Internal view. Two-thirds natural size.

Fig. 3. *Holmesina septentrionalis* (Leidy). Left maxilla of neotype, Amer. Mus. No. 26856. Palatal view. Two-thirds natural size.

## DESCRIPTION OF NEW SPECIMEN

The specimen on which the above diagnosis was based may be designated neotype of *Holmesina septentrionalis*, and the following description will fix the distinctive characters, which are hardly discernible from the original types of Leidy, isolated scutes. This specimen, Amer. Mus. No. 26856, includes the left lower jaw complete except for the extreme anterior end and the tip of the coronoid. It contains half of the first alveolus and all of the other alveoli, with the second, third, fourth, sixth, and eighth teeth in place. Associated is the complete right premaxilla with its included tooth and most of the left maxilla, including much of the palatal process, but with both ends incomplete, with most of the fifth tooth and all of the sixth and seventh. An isolated tooth

[1]For Walter W. Holmes, in recognition of eight years of intensive work in the Pleistocene of Florida, with special emphasis on the edentates.

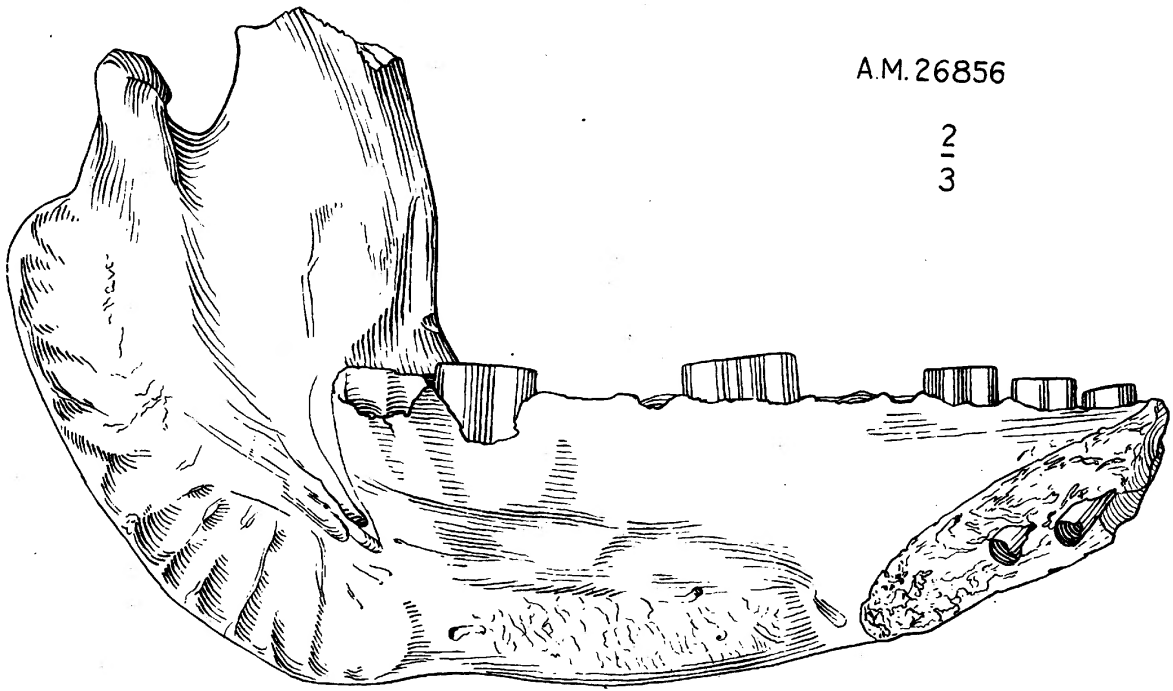


Fig. 4. *Holmesina septentrionalis* (Leidy). Left lower jaw of neotype, Amer. Mus. No. 26856. Internal view. Two-thirds natural size.

(apparently fifth right upper) probably belongs to this individual, and various scutes and isolated bones were found in the same pit. The locality is in Manatee County, about one mile south of the business district of Bradenton and one-quarter mile east of the Tamiami Trail, near Florida Avenue. The specimen was found with typical associated material of the Melbourne Fauna in the same stratum as the types of *Parelephas floridanus* (see Simpson, 1930) and near that type locality. The present locality is designated by Holmes as the Florida Avenue pit of the Bradenton Field.

The premaxilla is small. Its nasal suture is straight and nearly parallel to the alveolar border. The bone is notched anteriorly and its anterior lower part curves inward markedly. The palatal portion is narrow, indicating a width of 10 or 12 mm. between the opposite first aveoli, between which are the small anterior palatal foramina. The anterior tips of the two premaxillæ were not in contact. The maxillary suture begins above the boss of the upper end of the first aveolus and opposite the middle of the protruded part of the second tooth. It curves forward and passes between the first and second teeth, then backward to a point at about the middle of the second. The second tooth is thus excluded from the premaxilla, but its aveolar walls are partly clasped by premaxillary processes. The arrangement is much as in *Kraglievichia* but unlike *Chlamytherium* in which there are said to be two teeth in premaxilla.

The first tooth, wholly in the premaxilla, curves inward and forward. In section it is oval, the larger part posterior, with a very slight vertical anterointernal groove. Its greatest diameter is 9.5 mm.

The maxilla has an upper part, which narrows anteriorly and apparently continued the curved surface of the nasals, an alveolar part, which lodges the teeth and from which the zygoma springs, and a palatal part. The facial exposure of the alveolar part in front of the zygoma is hollowed out and separated from the upper part by a curving angulation. The zygoma arises chiefly opposite the seventh tooth and its base contains a large sinus. The infraorbital canal is 44.5 mm. in length, entering the bone above the anterior half of the eighth and leaving it above that of the sixth tooth. The palatal part is thick, long, and narrow. From the inner edge of the sixth alveolus to the midline is about 15 mm.

The sixth upper tooth is 21.8 mm. in anteroposterior diameter, the fifth and seventh slightly less. These teeth are bilobed in section. On the sixth, the external surface is marked by a broad and faintly double vertical groove near the middle, the internal by a narrower and single

groove somewhat more anterior in position. The seventh is similar but with the external groove more distinctly double, while on the fifth it is single. The total height of these teeth (which are, of course, rootless) is about 47.50 mm., of which only 3 or 4 mm. protruded from the alveoli.

The lower jaw agrees in essentials with that previously described by Sellards (1915). The angular expansion extends somewhat farther upward and the condylo-angular notch is a little more distinct. The anterior border of the coronoid is somewhat less inclined. The vacuity on the internal surface opposite the eighth tooth, present in most previous specimens of this subfamily (including those of Sellards and of Cahn referred to this genus), is absent. Since this transmits no vessels or nerves, its absence may well be fortuitous, although it was given taxonomic value by Sellards.

The first four lower teeth of *Holmesina septentrionalis* differ significantly from those of any of the Pliocene or Pleistocene South American species. The third and fourth are of nearly equal size, as in *Vassallia*, somewhat less unequal than in *Chlamytherium* and considerably less than in *Kraglievichia*. The fourth is larger relative to the fifth than in *Vassallia*, slightly smaller than in *Chlamytherium*, and much smaller than in *Kraglievichia*. The first tooth probably and the second certainly agree rather well with *Chlamytherium* in form. The third is more complex than in the South American genera. There is a well defined internal groove, somewhat in advance of the middle, and the posterior end is formed by an oblique anterointernal-posteroexternal surface, gently concave in horizontal section, which appears to truncate the tooth. The fourth tooth is also unique. In *Vassallia* it is like the third and simply oval. In *Kraglievichia* and *Chlamytherium* it is quite unlike the third and grooved on both sides. In *Holmesina* it is like the third, grooved internally, truncated posteriorly, evenly convex externally. The internal groove is sharper than on the third and rather more posterior, and the truncation better defined. The fifth to eighth teeth most nearly resemble those of *Kraglievichia*. The fifth, grooved externally only in *Vassallia* and *Chlamytherium*, is grooved on both sides, the internal sharper, deeper, and more anterior. The sixth has a large, broad, median external groove and three shallow, narrow internal grooves, the middle one least well defined. The seventh has a similar external groove and a single more shallow internal groove in advance of the midline. The eighth is similar but has a second very vague internal groove posterior to the first. The ninth tooth is somewhat smaller relative to the eighth than in *Chlamytherium*, larger than in *Kraglievichia*. Its form is like that of

*Vassallia* or *Kraglievichia*, pyriform, grooved on both sides, with the posterior lobe smaller.

The lengths (horizontal anteroposterior diameters) of the teeth follow. Those marked * are internal measurements of the alveolus below the mouth where the walls are parallel and closely approximated to the tooth.

| Tooth or alveolus | Length |
|---|---|
| 2 | 10.2 |
| 3 | 12.2 |
| 4 | 13.5 |
| 5 | 19.6* |
| 6 | 22.3 |
| 7 | 22.4* |
| 8 | 19.1 |
| 9 | 13.0* |

The order of length is thus 6=7, 5, 8, 4, 9, 3, 2, (1). Castellanos gives the following order for type species of the other genera in question:

*Chlamytherium:* 6, 7, 5, 8, 4, 9, 3, 2, 1.

[Winge's figures for *C. majus* give the same order.]

*Kraglievichia:* 6, 7, 8, 5, 4, 9, 3, 2, 1.

*Vassallia:* 6, 7, 8, 5, 9. 4=3, 2, 1.

The length of the jaw as preserved is 228. mm. and estimated total length about 240 mm. The size is approximately that of *Chlamytherium humboldtii* and somewhat smaller than *C. giganteum* (or *majus*), the largest known armadillo.

## RELATIONSHIPS

It is obvious that *Holmesina septentrionalis* is related to *Chlamytherium*. It was formerly referred to the type species of that genus, and even after specific separation was established, it continued to be placed in *Chlamytherium*. The Pliocene and Pleistocene of South America contain a series of some nine, or fewer, species which form the dasypod subfamily Chlamytheriinæ. The range of differentiation is not great, and earlier work placed all the species, from the lower Pliocene to the subrecent, in the single genus *Chlamytherium*.[1] Recently Castellanos (1927) has published a preliminary revision of the subfamily in which he divides the Pliocene forms into two new genera and restricts the name *Chlamytherium* to the Pleistocene species. *Vassallia* (type, *Chlamytherium minutum* Moreno and Mercerat) occurs in the Araucanian, and

[1]Generally written *Chlamydotherium*, but the original spelling was that here used.

*Kraglievichia* (type, *Chlamytherium paranense* Ameghino) in the Entrerian and Monte Hermoso. *Chlamytherium* (type, *C. humboldtii* Lund; synonym *Pampatherium*, type *P. typum* Ameghino) occurs in the Pampean of Argentina and caves of Brazil.

If these three types of chlamytheres be retained in a single genus, then the Florida form belongs in that genus. If Castellanos is followed,

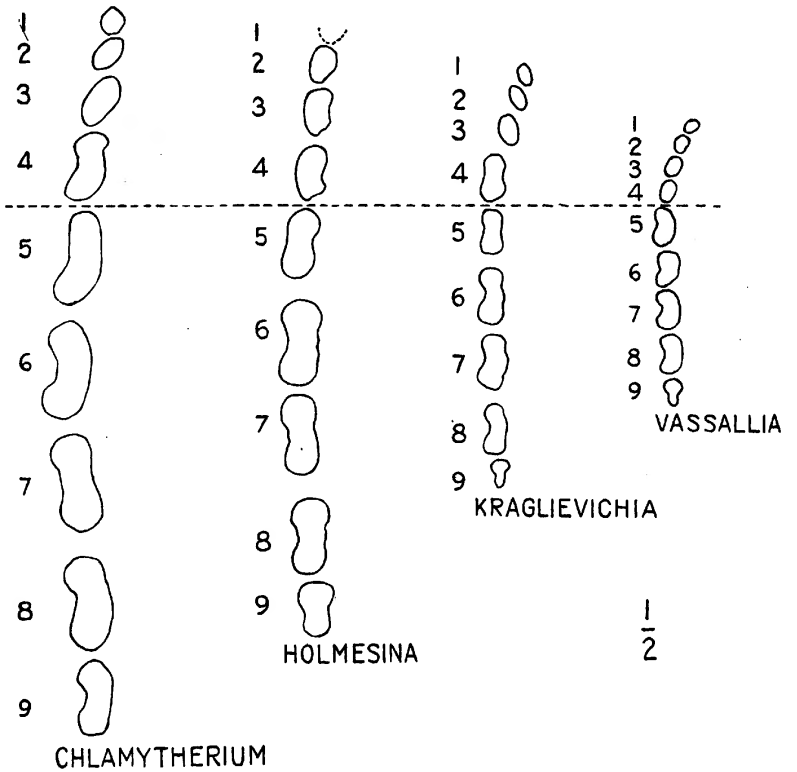


Fig. 5. Chlamytherinæ. Comparative series, showing crown outlines of left lower teeth of the four known genera. For ease of comparison the dentitions have been placed on a base line passing between the fourth and fifth teeth. All but *Holmesina* are redrawn after Castellanos. One-half natural size.

which is probably preferable if not obligatory, then the Florida species cannot be referred to any of his three South American genera, for it differs from them as much as they differ among themselves.

Except in the size of its type species, *Holmesina* resembles *Kraglievichia* somewhat more closely than it does *Chlamytherium*. The osteology of the known parts generally agrees with *Kraglievichia*. The

only really distinctive feature is the maxillo-premaxillary suture. This is very different in the two genera as described by Winge and Castellanos, and *Holmesina* agrees much more nearly with *Kraglievichia*. The differentiation in form of the first four lower teeth, as described above, is quite different from that of any South American form but is more readily derivable from the more primitive Pliocene genera than from *Chlamytherium*. The following five teeth agree fairly well in form with *Kraglievichia* and differ characteristically from *Chlamytherium*.

The most valid conclusion on present evidence is that *Chlamytherium* and *Holmesina* represent equally advanced but distinct lines of differentiation from the Pliocene chlamythere stock. With increasing knowledge (and increasing taxonomic refinement) of animals participating in the Neotropical-Holarctic interchange, such a relationship is proving common, although not invariable. The Pleistocene or Recent animals of groups spreading over the two continents often prove to be of distinct genera tracing their common origin to a Pliocene or late Miocene stock on one of the continents.

The wider relationships of the chlamytheres constitute a problem of considerable difficulty, necessitating examination of more material than is available to me. Ameghino traced the subfamily to his genus *Machlydotherium* (an anagram of *Chlamydotherium*) from the Oligocene *Astraponotus* beds. So far as I know, this genus has not been adequately described or figured and judgment is suspended, but Castellanos accepts the relationship. Various Santa Cruz genera have been considered as related to the chlamytheres, such as *Proeutatus* (by Winge), but the relationship is not direct and is very uncertain.

The structure of the chlamytheres is wholly armadilloid, and their removal from the family Dasypodidæ is not warranted. The retention of true incisors is not unique, and a similar but less marked tendency toward tooth complication is evident in some other dasypod lines. There does not seem to be any valid evidence for the view often expressed, supported by Ameghino and quoted with approval by Castellanos, that the chlamytheres are intermediate between armadillos and glyptodonts or derived from the specifically proto-glyptodont armadilloid stock. The chlamytheres are typical armadillos; their convergence toward the glyptodonts is very slight, superficial, and not confined to them. The glyptodonts appear to have been fully distinct in the Oligocene, while only late Pliocene or Pleistocene chlamytheres show even a limited degree of resemblance to that group.

The chlamytheres are the largest and in this and some other respects the most progressive of all the armadillos.

## REFERENCES


CAHN, A. R. 1922. *Chlamytherium septentrionalis*, a fossil edentate new to the fauna of Texas. Jour. Mamm., III, pp. 22–24.

CASTELLANOS, A. 1927. Breves notas sobre los clamidoterios. Centro Estud. de Ingeneria de Rosario. Pp. 1–8. [With references to South American chlamytheres, not repeated here].

HAY, O. P. 1926. A collection of Pleistocene vertebrates from southwestern Texas. Proc. U. S. Nat. Mus., LXVIII, Art. 24, pp. 1–18.

LEIDY, J. 1889A. Fossil vertebrates from Florida. Proc. Acad. Nat. Sci. Philadelphia, 1889, pp. 96–97.

1889B. Description of vertebrate remains from Peace Creek, Florida. Trans. Wagner Free Inst. Sci., Phila., II, pp. 19–31.

SELLARDS, E. H. 1915. *Chlamytherium septentrionalis*, an edentate from the Pleistocene of Florida. Amer. Jour. Sci., (4) XL, pp. 139–145.

SIMPSON, G. G. 1928. Pleistocene mammals from a cave in Citrus County, Florida. Amer. Mus. Novitates, No. 328, pp. 1–16.

1929A. Pleistocene mammalian fauna of the Seminole Field, Pinellas County, Florida. Bull. Amer. Mus. Nat. Hist., LVI, pp. 561–599.

1929B. The extinct land mammals of Florida. Ann. Rept. Fla. State Geol. Surv., XX, pp. 229–280.

1930. Additions to the Pleistocene of Florida. Amer. Mus. Novitates, No. 406, pp. 1–14. [Bradenton Field, pp. 5–12].

WINGE, H. 1915. Jordfundne og nulevende Gumlere (Edentata) fra Lagoa Santa, Minas Geraes, Brasilien. E. Museo Lundii, III, Part 2.